



SATI-Q PEDIATRIC PROGRAM

DEMOGRAPHIC PROFILE AND OUTCOMES OF CHILDREN ADMITTED TO PEDIATRIC INTENSIVE CARE UNITS IN ARGENTINA

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ABSTRACT

Background: SATI-Q is a voluntary program, sponsored by the Argentine Society of Intensive Care. It's aim is to collect data related to quality benchmarking in Argentinian Pediatric Intensive Care Units (PICU).
Objective: to describe the demographic profile and evolution of patients admitted to the PICU members of the SATI-Q program.
Design: national, multicenter. Observational. Analysis of prospectively collected data of the SATI-Q program database.
Setting: 8-25 PICU located in public or private setting and in general or pediatric hospitals.
Patients: Children from 1 to 191 months admitted to the participating PICUs, between 1/1/2010 to 31/12/2014.
Results: 11637 patients were admitted to the participating PICUs ; 59.7% were males (6948/11637). Their median age was 25 months (interquartile range(IQR): 7-90) and 37% had <13 months. Chronic complex conditions were present in 27.34% (3181/11637) of admissions. The main admission reason was respiratory disease (30.1%) followed by posoperative admissions (27.8%).
A total of 5766 patients (45.66%) patients required mechanical ventilation (MV). Median length of MV was 6 days (IQR: 2-13). 5% of children required >45 days of MV.
Median length of stay was 4 days (IQR: 2-11).
Nosocomial infection rate was 9.8 ‰ patient days, being ventilator associated pneumonia the most frequent one (7.3‰ MV days)
A total of 987 patients died in PICU (8.48%) whereas mortality predicted by PIM2 was 7.25%. Standardized mortality ratio was 1.17 (95% CI: 1.1-1.24).
Conclusions: most children admitted to argentinian PICUs are younger than 13 months. Respiratory illness is the main admission reason. Mortality is higher than expected. Rates of nosocomial infections constitute a problem

INTRODUCTION

Critical illness is a rare event in childhood. Overall each PICU cares for a small number of heterogeneous patients with relatively rare diseases because of its diagnosis or the severity of its presentation.

The above mentioned characteristics generate the necessity of multicenter registries for quality benchmarking, clinical investigation and to optimize PICU management.

SATI-Q pediatric initiative is a voluntary program sponsored by the Argentine Society of Intensive Care. Its main objective is to collect data related to quality benchmarking in Argentinian PICUs. However, the analysis of this database also enables the performance of epidemiological studies and it has been increasingly used for clinical research.

The knowledge of the characteristics of patients admitted to PICU allows a proper planning of the care provided to this population, based on their specific demands. Outcome analysis is the first step to guide quality improvement initiatives.

The demographic profile and outcome of PICU patients can vary widely in different countries. Published data about critically ill children in Latin American PICUs are scarce.

The analysis of the SATI-Q database enables to describe the characteristics and outcome of a wide sample of children admitted to PICUs in Argentina.

OBJECTIVE

To describe the demographic profile and evolution of patients admitted to the PICU members of the SATI-Q program.

MATERIAL & METHODS

Design: Observational. National, multicenter. Analysis of SATI-Q program database.

Setting: PICU members of the SATI-Q program. These units belong to the public and private health system and are located both in general and pediatric hospitals.

Patients: all consecutive patients admitted to the participating PICUs, between 1/1/2010 to 31/12/2014.

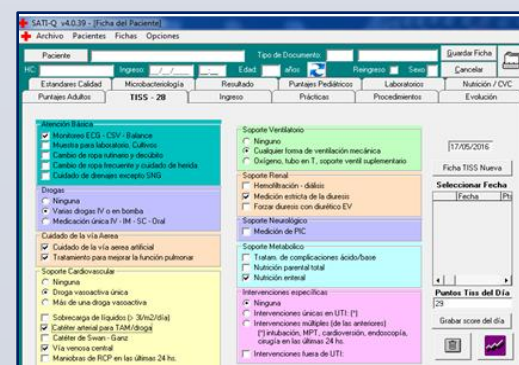
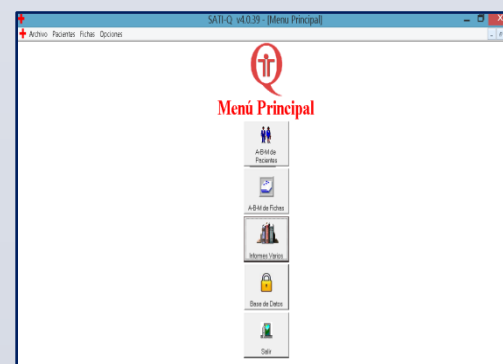
Exclusion criteria: neonates and children older than 191 month

Data collection: the following data are collected prospectively for each admission: age, gender, admission source, admission diagnosis, severity of illness estimated by PIM2, use of invasive devices (mechanical ventilation, central/arterial catheter, nasogastric tube and urinary catheter).

The quality indicators registered are nosocomial infection rates (ventilator associated pneumonia, catheter associated bloodstream infections, catheter associated urinary tract infections, wound infections), sores, falls, nasogastric tube displacement and accidental extubation.

PICU length of stay, treatment outcome (death/ alive) and the level of care needed at the moment of PICU discharge (general ward intermediate care, homecare) are registered for all admissions

Data collection instrument: SATI-Q software, a computing tool provided free of charge to Argentine PICUs that are part of the SATI-Q program

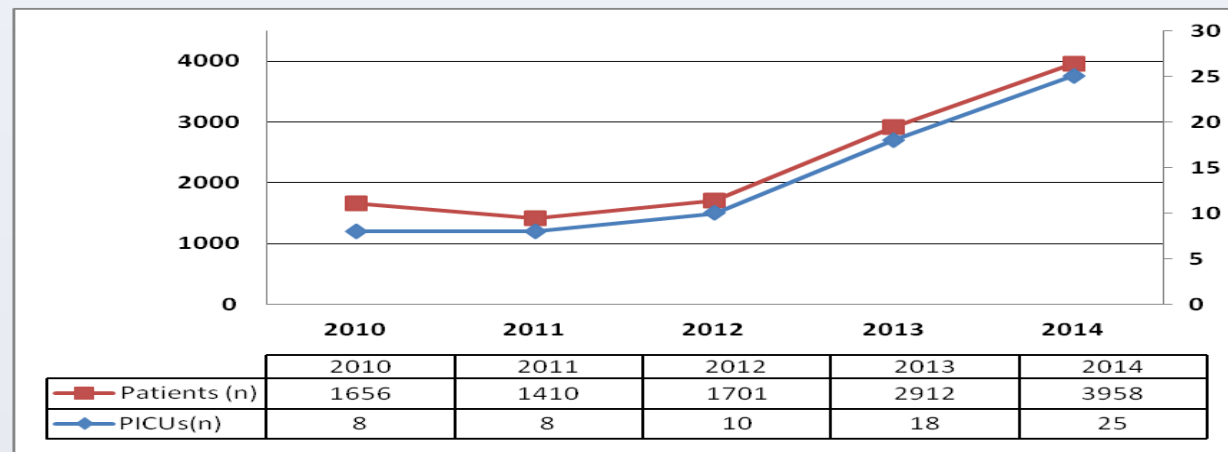


Statistical analysis: Data analysis was performed using STATA11 IC. Descriptive statistics was performed to characterize patients population. The continuous quantitative variables were expressed as the mean \pm SD or median and interquartile range (IQR) according to their distribution. Discrete quantitative variables were expressed as median and range or median and IQR. Categorical variables were expressed as frequencies and percentages.

RESULTS

11637 patients were admitted to the PICUs that integrate the SATI-Q Program

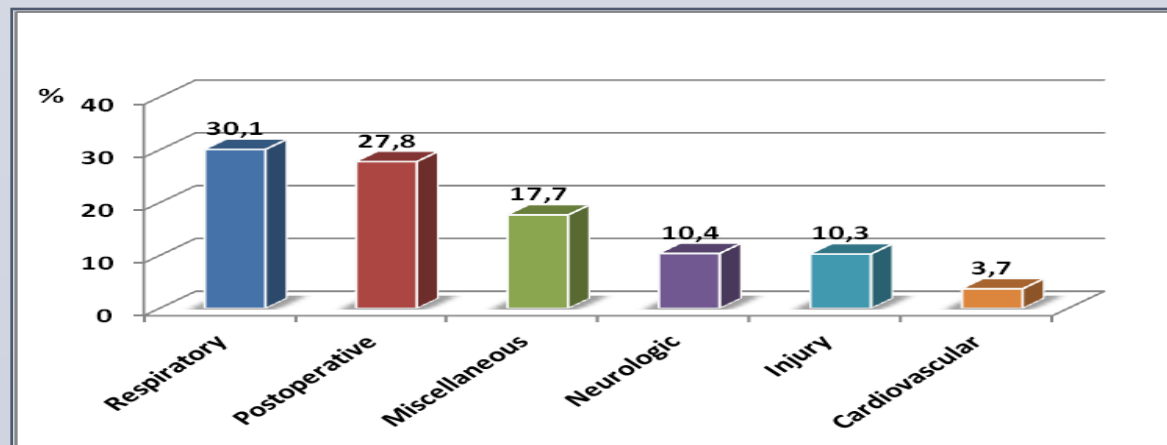
PICU admissions and participating PICUs, by year



Patient's characteristics

Male gender (n.%)	6948	(59.7)
Age. months (median. IQR)	25	(7-90)
Age categories (n%)		
1-12 months	4318	(37.1)
12-23 months	1338	(11.5)
2-6 years	2096	(18.1)
6-12 years	2507	(21.5)
12-16 years	1378	(11.8)
Chronic Complex Conditions (n.%)	3181	(27.3)
PIM 2 (mean. SD)	7.26	(15)
Low Risk Diagnosis	1156	(9.9)
High Risk Diagnosis	1211	(10.5)
Admission Source (n.%)		
General Ward	3855	(33.1)
Pediatric Emergency room	3814	(32.8)
Operating room	3123	(26.8)
Intermediate Care	468	(4)
Other PICU	299	(2.6)
Home Care	78	(0.7)
Elective admissions	2995	(27.7)
Mechanical Ventilation on admission (n,%)	4955	(42.6)

Admission Diagnosis



RESULTS

Demographic profile and MV treatment, by diagnostic categories

Diagnosis	n	Age (months) median (IQR)	PIM2* (mean;SD)	CCC (n;%)	MV (n;%)	MV days median (IQR)
Respiratory	3498	8 (3-27)	6.1 (10)	908 (26)	2484 (71)	8 (4-15)
Postoperative	3232	49 (2-124)	2.3 (6.8)	1127 (34.9)	882 (27.3)	3 (1-8)
Miscellaneous	2064	30 (8-98)	12.4 (20.5)	575 (27.9)	958 (46.4)	6 (2-14)
Neurologic	1206	40 (12-101)	8.8 (16.0)	365 (30.3)	654 (54.2)	4 (2-11)
Injury	1203	59 (22-122)	11.0 (21.0)	49 (4.01)	581 (48.3)	4 (2-9)
Cardiovascular	434	12 (4-60)	14.2 (22.7)	157 (36.8)	208 (47.9)	6 (2-15)

*PIM 2: probability of death estimated by PIM 2; CCC: chronic complex condition; MV: Mechanical ventilation; IQR: interquartile range; SD: standard deviation

Quality Benchmarking Indicators

Quality Indicator	Rate	
Device- associated nosocomial infections (‰ patient days)	9.8	1145/116595
Accidental extubation rate (%)	5.2	300/5767*
Sores (%)	1.39	162/11637**
Accidental nasogastric tube displacement (%)	0.83	55/6618
Wound infection (%)	0.53	17/3232#
Falls (%)	0.14	16/11637**

**Patients on mechanical ventilation;; ** Admitted patients; # Postoperative patients.

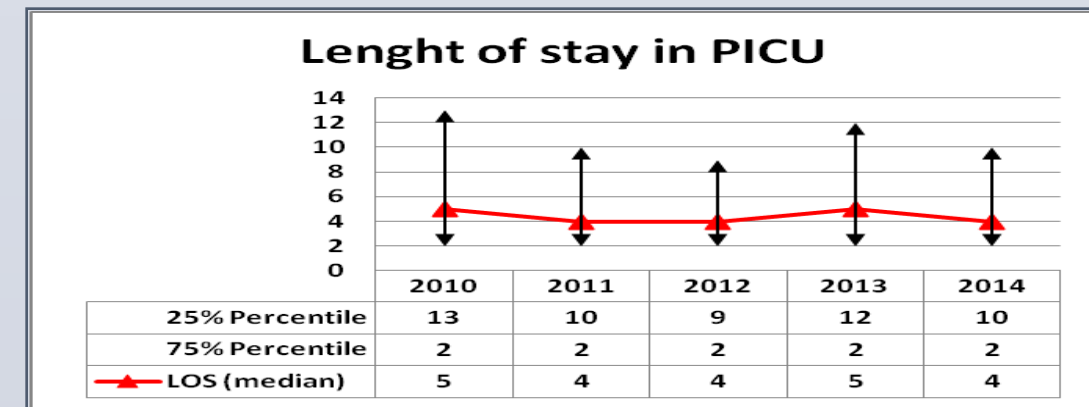
Device associated Infection Rates*	
Ventilator associated Pneumonia	7.3 ‰
Catheter associated Urinary tract infections	7 ‰
Central Line associated Bloodstream Infections	4.2 ‰

* Infection episodes/ device utilization days

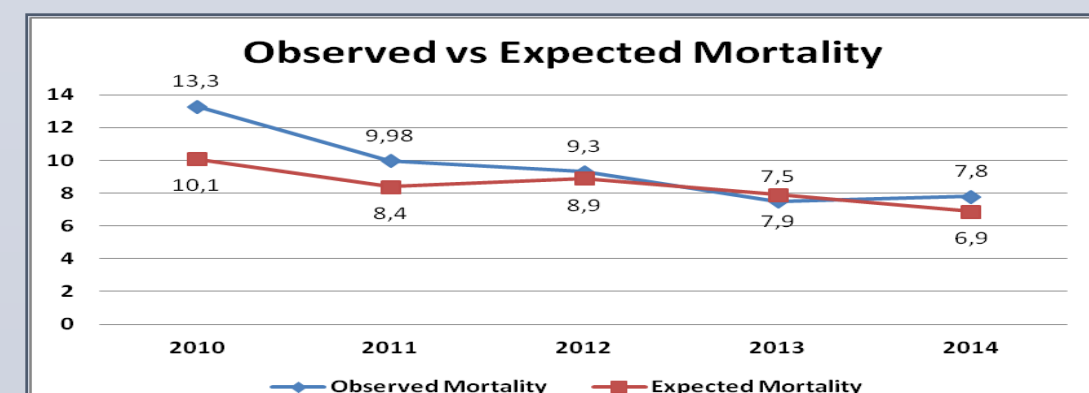
Device utilization ratios*	
Mechanical Ventilation	61%
Urinary Catheter	44%
Central Line	53%

* Device utilization days/ patient days

Length of Stay and Mortality



LOS: length of stay in days



Mortality ratio expressed in percentage

RESULTS

Outcomes according to diagnostic categories

Diagnosis	n	Length of stay Days, median (IQR)	Mortality (n;%)	SMR
Respiratory	3498	8 (4-15)	271 (7.7)	1.27 (1.12-1.43)
Postoperative	3232	3 (1-5)	79 (2.4)	1.1 (0.85-1.32)
Miscellaneous	2064	4 (2-11)	320 (15.5)	1.25 (1.12-1.39)
Neurologic	1206	4 (2-10)	130 (10.8)	1.22 (1.03-1.45)
Injury	1203	3 (2-8)	114 (9.5)	0.86 (0.71-1.03)
Cardiovascular	434	4.5 (1-12)	73 (16.8)	1.18 (0.93-1.48)

IQR: interquartile range; SD: standard deviation; SMR: Standardized mortality ratio; CI 95%: confidence interval

CONCLUSIONS

• Most children admitted to this sample of argentinian PICUs were younger than 13 months. Respiratory illness was the main admission reason in the whole population, specially in infants

• Patients admitted to these sample of local PICUs were more severely ill (according to PIM2 probability of death) than patients admitted to PICUs in Europe or United States. At the same time, the observed mortality was higher than predicted by PIM2.
• The improvement of the rates of device associated infections represent a challenge in this population, specially considering the high rate of device utilization.

• Pediatric critical care registries are essential to improve the quality of care for critically ill children.

• The knowledge of the characteristics of the patients admitted to local PICUs and the outcome analysis is the first step to guide quality improvement initiatives .

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